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THE PROBLEMS OF HUMAN VERBAL BEHAVIOUR: THE FINAL REFERENCE FOR MEASURING OSTENSIBLE PSI PHENOMENA

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ABSTRACT

Ultimately, some form of human verbal behaviour, displayed as vocal-textual reports, semantic sequences, or "thoughts", is the final reference point for evaluating ostensible psi phenomena. Properties and principles of verbal behaviour are discussed in this context. The confounding variables of inappropriate labelling, contiguous contamination, conditioned word sequences, reification of models, semantic symmetry, dependence upon subjective references, and measurement of the measurer in psi research are discussed. Operationally, it is shown that even "thought" responses can display expected alterations in patterns, e.g., all or none responding (belief or non-belief) evasive profiles (displacement of technical statements by poetic forms), in the presence of insoluble psi problems which are invariably associated with aversive stimuli, death-relations or unexpectancies. Questions are asked concerning the precarious role of the scientist as a verbal animal with possible personal susceptibilities to the effects of psi stimuli.

INTRODUCTION

The proficient scientist recognizes the limitations of his measurement devices and attempts to attenuate or obviate the contribution of measurement artifacts. Control for measurement artifacts can be instituted by using different procedures or apparatus, whose constructions are based, optimally, upon alternative principles. After such adjustments have been made, consistencies in measurement during the presence of the same stimuli are considered veridical; any differences uniquely and systematically associated with a particular measurement apparatus are suspected as an artifact - a peculiarity of the instrument's construction.

In a time of technical sophistication, such methodological precautions are routine and expected. Unfortunately, it is too often forgotten that the ultimate measurement device will be some aspect of human behaviour. Ultimately, the complex data matrices, the impressive recordings from mechanical or electromagnetic sensory extensions, and the perceived activities of the environments inside and outside the human skin, evoke changes in perhaps the most complicated of all response-measurement systems: private human behaviour, i.e., "thought". Expressed in another language, human

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thought responses and related behaviours are the final measurement devices, the terminal reference points.

Yet we are only beginning to understand some of the limitations of this tool; we are only starting to suspect the possible artifacts inherent within this measurement device; we are only initiating the analysis to determine the distortions of this response system. It is not clear to what extent the features of human thought and vocal behaviour are determined by the species' genetics or by the individual differences in reinforcement history (experience). However it is clear that many of the phenomena now classified under the rubric of the parasciences may only reflect the artifacts and idiosyncratic construction of human thought behaviour [1]. The enthusiastic researcher should be cognizant of these possible confounding variables.

In this paper, some inherent problems of human beings as verbal animals will be discussed. Some of the problems will be obvious while others may test the reader's semantic discrimination; although they may appear to be minor disparities of verbal behaviour (vocal and "thought"), it must be realized that this behavioural mode is the primary expression of our species. Any minor fluctuation in sequence may have pervasive and potent effects upon behaviour.

It is appropriate for the initiation of the new journal, oriented towards: 1) objective analyses, 2) interdisciplinary approach, 3) realistic theoretical constructions, and 4) testable hypotheses, of psi phenomena that some fundamental questions are raised about the human being, scientist or non-scientist, in the presence of paranormal stimuli. We must now closely scrutinize man's primary measurement mode: verbal behaviour, within these contexts.

DEFINITION OF HUMAN VERBAL BEHAVIOUR

The human organism is a locus of behaviours, characterized by response systems that are defined by their shared probabilistic frequency of occurrences to particular stimuli. Some of these behaviours are measurable by the human observer without appreciable technical assistance, while others require instrumentation. In essence the kinds of responses detected by various types of instrumentations determine man's different scientific disciplines, i.e., "levels of discourse".

From some perspectives, verbal behaviour is one of the most important behavioural types displayed by the human organism since it is used as a final reference point and measurement. As Skinner [2] aptly points out, verbal behaviour is behaviour reinforced (change in frequency of occurrence) through the mediation of an audience. Typically the audience is other people, although instances occur where the individual talks to himself in the sense that one system of responses of his behaviour acts upon another. Verbal

behaviour involves several modes, including vocal (talking), textual (written), non-vocal ("body language"), and private ("thought") forms. With the exception of the latter form, verbal responses are public behaviours since they can be systematically viewed by other people. Increasing experimental evidence suggests that the principles responsible for public and private verbal behaviours do not differ significantly [3,4].

Since the occurrence of verbal behaviour is increased (or decreased) by its consequences, (the principle of reinforcement, see [5]) the same verbal responses can occur in markedly different situations. Thus the statement "I saw an alien" or "I saw an apparition", may be displayed whenever the person is in the presence of a peer group (his friends) if such statements have been reinforced, but not in the presence of other social situations (interviews) where such behaviour has not been reinforced. It would be inappropriate to project explanations such as "the person is fragmented" or "the person is lying" or to presume the presence or absence of "awareness". Operationally, the person has learned just to display responses in one situation but not in another. The reference to some type of subjective control by the reporter is not required and may lead to unfounded conclusions about what is "causing" or controlling the person's statements.

From a behaviouristic framework (which can accommodate ostensible paranormal experiences by virtue of its inclusion of verbal behaviour) there is no reason to impute motives to the reporter of an unusual event. Questioning the reporter about an unusual event in order to determine if he or she was "lying" would be inappropriate for at least two reasons. First, discrepancies between what a person "thinks" (private responses) and what he says (vocal behaviour) may only reflect different reinforcement contingencies for the two systems. It is not possible to objectively determine if the person is aware of the "discrepancy"; in fact results of experiments indicate "awareness" is not a necessary situation for conditioning [6,7]. Secondly, and most important from an analytic perspective, the most likely measurer of any discrepancy would be the person himself. To date we have not developed techniques that will allow us to be "audiences" of a person's private behaviours; our primary measure of what a person is ostensibly "thinking" is still his public behaviour, (the vocal and textual behaviour). As mentioned, however, vocal behaviour can come under the control of many unrelated, situation specific stimuli.

SUPERSTITIOUS BEHAVIOUR AND ARTIFACTS OF CONDITIONED VERBAL SEQUENCES

Individuals who have not objectively studied human behaviour commonly believe (belief: when a person responds systematically to a particular stimulus with responses that have not been

tested or are not testable) in the omnipotence of human "thought", especially the "thoughts" of the person himself. This misconception ignores the demonstration that the human organism is a locus of diverse behavioural systems (motoric, autonomic, biochemical, etc.) some of which are highly inter-related, others which are not. "Thought" is only one response system. Depending upon reinforcement history (previous conditioning patterns) of the organism, the occurrence of some "thoughts" may be associated with the display of some other response change, e.g., muscle movement, such that the two are prone to occur together in space-time. When the thought response system is involved in such pairings, a human being might state that he was aware of the movement and that he "controlled" the movement.

Although frequently an accurate description of changes across the body locus, "awareness" statements are not totally reliable. Reasons given by a person as the cause of a body change may have little to do with the actual control variables. A colorful case in point involves a subject who walked across the room and closed a window after the key word of a post-hypnotic suggestion was presented. When asked why he closed the window, the subject did not answer "because the hypnotist told me to"; instead, he quickly responded: "Oh, I don't know, I sort of felt cold, yes, I definitely felt cold", with a notable progression in definitiveness.

Confounding contributions by temporally contiguous but unrelated behaviours are more common than realized. A behaviourist might refer to such responses as superstitious sequences. If different behaviours are displayed in close temporal proximity with a response whose occurrence delivers reinforcement, then the former behaviours are reinforced as well. Awareness of these processes is not a prerequisite condition; in fact, the awareness responses may be subject to superstitious reinforcement.

An apt example of this behaviour might be displayed by a drowning person. During the drowning sequence, many response systems are activated, e.g., increased motor activity, increased cardiovascular responding, and increased private behaviours ("thoughts") such as "God save me" or some other magical demand. If the drowning person is saved as a consequence of a particular motor movement (swimming) then this behaviour is reinforced. However, since awareness behaviours (e.g., "God save me") were also being displayed, they are also reinforced (strengthened) and the number of times the person says and thinks "God saved me" would increase. Analogous occurrences of superstitious conditioning within human verbal behaviour are rarely controlled in many psi-related studies.

Another important feature of verbal behaviours involves the mechanism by which they are acquired. As B.F. Skinner points

out, the development of verbal behaviour seems to follow the same principles as other organismic movements. Of great relevance to psi research is the principle of paired association and learned sequences ("intraverbals"). If the letters ESP are paired repeatedly in space-time with SAP, soon just the presentation of the word ESP will increase the likelihood that "thoughts" about SAP would be emitted. In fact the person may expect to see the letters SAP and if they were not presented, the subject could display some type of unpleasant arousal as a consequence of the unexpectancy.

Semantic structure follows a similar operation of acquisition. During childhood, we develop an association between question and answer stimuli, since the two semantic structures are frequently paired in time-space, e.g., we ask "what is a chair?" and the parent (pointing to a chair) says "that is a chair". Although this technique allows human beings to label their environment, there is a concomitant tendency to also formalize and reinforce the question-answer operation. After many pairings of such operations, it is normal for the adult to assume that any series of words framed within the question sequence must have an answer. If no answer is immediately forthcoming, the person frequently displays the classic mammalian emotional responses to an unexpected stimuli, especially if the question involved word symbols associated with aversive stimuli (e.g., death, pain). Classic emotional responses involve visceral activity, disorganization of any ongoing behaviour (even "thoughts") and frustrative aggression (verbal or motoric).

The question-answer paradigm is a strong and persistent pattern in human language systems. Whenever a question is posited, the average human expects an answer. Even when one states that every question *may not* have an answer and that some questions are nonsensical, expectancies of an answer are still evident. In the history of science various nonsensical questions have been posited such as "how many angels can dance on a pin's head?" or "can a triangle be made with two sticks?" Even today these limits of semantic construction are not understood by some researchers.

The potency of the question-answer paradigm cannot be over-emphasized. When lecturing about the limitations of verbal behaviour, a common practice of this experimenter is to write the question "What is a klug?" on the blackboard. Even after extensive conditioning concerning learning principles, a typical student comment is "sure I know there's a limitation to language, but tell me now, what really *is* a klug?" The persistence of such responses as "what *is* man?" or "what *is* the experience of after-death?" (with emphasis on the "is"), suggests the tremendous power of question-answer operations in verbal-semantic behaviour. For reasons which are beyond the scope of this paper, it is not spurious that many of the problem questions posed within human verbal behaviour involve

questions concerning non-empirical ("non point-to-able") objects or non-discrete events, such as gods, time, and spirit.

The patterns of the paranormal are replete with similar *possible* semantic obstructions. Invariably, the paranormal is involved with death and crisis. Questions such as "will I survive death?" or "what is psychic energy?" or "what is the soul?" or what is ESP?" are but a meager sampling of the total population of words frequently placed within a question format. The possibility should be acknowledged that many of these questions are nonsense. Pursual of their answers would be as futile and wasteful as attempting to determine "how many angels can dance on a pin's head?"

APPARENT PROPERTIES OF PRIVATE (SUBJECTIVE) BEHAVIOURS

The problems of recording or responding to unusual stimuli with private ("thought") behaviour become acute when one realizes that human beings use this form of behaviour as a final reference point to describe their environment. Evidence of this propensity can be noted whenever thought behaviour is being displayed either by the person experiencing the "thought" himself or by reference to the verbal behaviour. Statements such as "I am a self", "I control my behaviour", "there is a me that exists" and related types of responses alluding to the behavioural locus demonstrate higher probabilities of being emitted whenever "thought-related" processes are occurring. This propensity is more obvious when socially unverified phenomena are discussed; a common statement is "yes, *I* believe ghosts, UFOs, etc. exist because *I* have seen them", or "no *I* do not think ghosts, UFOs, etc., exist because I have *not* seen them", The egocentric and correlative thought-centric reference point for proof of existence is an important confounding variable in determining the veridicalness of a reported phenomenon.

The dependence by the scientist upon non-private verbal behaviour (what a person writes, says) as a measure of private behaviour is not the only limit for subjective experiences. Subjective experiences can also come under the control of different stimuli. Thus the experience of seeing an image of a man may result from an actual (publicly verifiable) stimulus, electrophysiological disturbances in the brain (epileptic auras), brain stimulation, or suggestable stimuli (hypnosis). Consequently, any person, an Einstein or a cretin, using merely private experience as a reference point may not necessarily be able to discriminate the type of stimulus source by himself only. Some other reference point, such as another human observer, would have to be employed.

The use of more than one person as measurement references (e.g., a battery of human observers) for ostensible paranormal stimuli may contribute to concluding that something is there, but it may not allow homogeneous or accurate descriptions of the stimulus, per se. It is interesting that different people may report different

experiences during the presence of the "same" stimulus. One example of such possibilities within this experimenter's files involves an instance when a young woman awoke suddenly one night and reported to see two dark shadows of humanoids moving on the wall. Her companion, who also reported to "suddenly awake" at the same time, reported seeing a light move across the same wall, increase diameter, and then slowly fade away. Similar situations were noted even in the 19th century by von Reichenbach. In the presence of "ignited" decomposing graveyard gases, he reported only diffuse luminescence; the villagers reported detailed descriptions of recently dead peers. Whether such instances reflect responses to different aspects of the same stimulus or whether different organisms characterized by different reinforcement histories respond in different ways to the same stimulus, is an important problem to be solved.

THE PROBLEM OF MEASURING THE MEASURER

The problem of measuring the measurer is one that permeates much of philosophical-psychological injury. It occurs because operationally the "thinker" is attempting to measure his "thoughts" with his "thoughts". The difficulty can be somewhat eliminated (although some people argue that the same problem no longer exists) by using another referent: what someone else says, and consequently comparing discrepancies (or similarities). As long as the person relies totally upon his own thought behaviour, monitoring of any (absolute) change in the thought behaviour as the reference would be difficult if not impossible. Analogously, if distance was measured *only* by meter sticks and then all the meter sticks were changed in the same way, we could not measure how much spatial change in the meter sticks had taken place since we would have to measure with the already modified measurer.

Behavioural scientists do not clearly understand what kinds of distortions or fluctuations may occur during normal displays of thought behaviour. One would predict, as with any response system, occasional statistical deviations from the normal display profile. No doubt these experiences would be reported or felt (by the reporter only) as real, authentic, true, etc. and the person may attribute the source of the experience to an external event. It is known that a large number of drugs and brain dysfunctions which alter the normal display of thought behaviour are associated with impressive testimonials concerning the reality and significance of the experience.

When considering psi phenomena, one must be especially sensitive to the possibility that much of the phenomena may be associated with distortions or irregularities not in the environment but within the measurement system: "thought". Such a statement does not imply that all people who report or experience psi

phenomena are unstable or psychotic. Instead, it suggests that some forms of psi phenomena may reflect normal but infrequent breakdowns in the primary response system. The fact that the majority of psi experience occur contiguously in space-time with aversive (traumatic) events, known disorganizers of other response systems, is important in this context.

A change in the patterns of thought behaviour also would alter the way the individual responds to (evaluates) the same stimulus. Such changes would be comparable to changing the "circuitry" of any measurement device. In psychology, this operation has been interpreted as changes in the "drive" of the person. Hence, a subject who is satiated may respond to a round stimulus (presented for a brief period) as simply a circle while the same person, following twenty-four hours of food deprivation, may perceive the same stimulus as an apple or pie.

Outside the closed set of laboratory conditions and expectations, the effect can be greater. For example, a person sitting alone reading a murder novel may interpret an infrequent but "normal" noise from the house as the "footsteps of a murderer". A believer in ghosts may interpret any stimulus, which outside the context is trivial, as an integral part of the ghost experience. The lone and belief-oriented experimenter would be susceptible to the same difficulties. He may respond only to results commensurate with his expectations; the display of "awareness" during such episodes would be indeterminable and for the most part irrelevant.

SINGLE LABEL DOES NOT IMPLY SINGLE MECHANISM

In fundamental operations, paranormal events can be defined as *instances reported or recorded that seem to involve mechanisms not known to date and/or seem to violate the accepted or expected principles of environmental operation.* Such a definition indicates that everything which does not fit into the present explanation, can be placed within the rubric of the paranormal. The problem is that what is known is finite and limited by the number of different verbal labels associated with it. Science requires such precise and numerous verbal labelling (from semantic descriptors to mathematical expressions) in order to partition phenomena into units. Without fragmentation of phenomena into systematically inter-related units (an operation which allows application to specific situations and hence more powerful prediction), science would be confined solely to dealing with an amorphous phenomenon typified by singular descriptions and explanations (such as God is everything, energy is everything) with very little practical prediction.

Unfortunately, paranormal events, be virtue of their definition, are outside the set of known events. Consequently, we may be applying an extremely small number of verbal labels to an unknown and probably extraordinarily large population of different

events. To further confound matters, such labels (e.g., UFO, apparition) are probably being applied to a large number of events whose *only* relation is *apparent* similarity during crude observation. For example, the term UFO has been applied, indiscriminately, to a ball of light, a luminous ellipse, a metallic-like object, an erratic pen-point of light in the star canopy, and to a variety of "similar" stimuli.

Although convenient for inter-personal communication, these labels can induce the uncautious researcher to conclude that any events associated with the same verbal label must have the same mechanism. Enthusiasts of specific psi labels (e.g., UFOs, apparitions, telepathy) routinely reject hypothesis after hypothesis simply because all the events associated with a single psi label can not be accommodated. Rarely, do these writers emphasize that all the reports may have in common is the label placed upon it by human observers with similar verbal backgrounds.

Singular labels do not imply singular mechanism; in fact, in the area of the paranormal, we must entertain the possibility that hundreds of different mechanisms may be responsible for phenomena that are perceived and labelled as similar by human beings. Hopefully, from the criteria of research hours and human verbal limits, a few basic mechanisms will accommodate most of what has been associated with paranormal labels.

HAZARDS OF LABELLING UNUSUAL PHENOMENA

Human beings generally attempt to categorize a new observation by labelling it with a word from their verbal repertoire. The choice of the word is based upon some generality between some previous stimulus associated with the word and the new stimulus and may involve metaphorical speaking (e.g., the event is like a ghost). If the person is from a culture with very few words suitable for the new observation, then the paired verbal description may seem contrived. For example, an Orinoco basin inhabitant might refer to a car as a thundering, larged eyed, hard skinned lizard because these terms best describe the noise and headlights of a slow moving steel vehicle. Unless the person has the discriminative capacities and the appropriate labels, the verbal observation of a new phenomenon may be misleading.

The effects of indiscriminate labelling do not terminate with cumbersome communication. Labels are not neutral, they carry explicit and implicit stimuli previously associated with them. A confounding interaction arises when one uses a label which is already heavily "loaded" with emotionally-laden associations. For example, suppose an observer sees a pulsating luminous light with dark stimuli moving within it. If the person labels the observation as a landed UFO, then the observation is no longer "neutral" since the previously learned associations of the word UFO may now contaminate

the observation. This process employs the use of implicit chains. It is known that when a new stimulus (X) is paired with another stimulus (Y) with which still another stimulus (Z) has been associated previously, the possibility stimulus X will be paired with stimulus Z increases. These chains may be very long and may not involve awareness [3]. The operation of this process in the above example could result in a report like: "I saw a UFO landed on the hill, it was slowly materializing and de-materializing, and there were aliens moving within."

When the memory function is added to this initially simple observation of an unusual light on a hill, more confounding factors intervene. As the time between the actual observation and the report increases, greater and greater reliance upon memory occurs. Research indicates the experiences people remember about an event are influenced by the label associated with the event. If a partial circle is presented and the person labels the stimulus as a circle, he may redraw the stimulus months later as a full circle. Geologists may remember the shape of geological formations not according to the initial stimulus but according to the label placed upon it [8].

Human beings assume that their memories are absolute and constant; they ususally do not recognize (or will not admit) that what one remembers can be altered by consequent events, especially if emotional stimuli are associated with particular memories. If a particular "thought" is associated with some negative (aversive) consequence, the "thought" may be suppressed (not thought about), and some other unrelated "thought" may occur. One well known scientist reported clear and vivid memories of running past a graveyard on the way to school as a youth; however, there was never a graveyard on the way to school according to his peers of the day. There had been a loud and noxious black dog.

The tendency to find discrepancies between a person's memory (as it is reported) and a particular event increases with the degree of emotional arousal associated with the event. Recall of such events may also invoke "memories" that were in no way related with the initial event; under emotional arousal the generalization gradients widen and other stimuli may be included in the report. One case in this experimenter's file is illustrative. A woman once told me that someone in the family would die; about a week later, the family's Uncle John died suddenly. The woman then came to me and said: "You see, I told you Uncle John would die". However, I mentioned that she said only that *someone* would die, but she insisted she had specifically named Uncle John. Later, one of the children (a member of faculty), who had been present at the initial "prediction" came to me quite proudly and said "You see, mother was right again, Uncle John died, just like she predicted." Although we are again dealing with the problems of measurement of

researcher is confronted by vague and limited descriptions. If two stimuli appear to be similar, the researcher may assume identity of the stimuli. Although this aspect of discrimination has been discussed in more detail elsewhere the rigidity of all or none responding is implicit. For example, the alleged human aura has been described for centuries as a glow around the body and is associated with a series of untestable statements. Then the Kirlian technique was developed which demonstrated similar glows around the body. Instead of thoroughly and systematically eliminating the possibility that the apparent similarities were accidental, some individuals hastily concluded that the Kirlian photographs *were* recordings of the human aura. Similiar plus similar is not always equal to the same.

EMOTIONAL RESPONSES TO INSOLUBLE PROBLEMS

Manifestations of fundamental mammalian learning principles become magnified when insoluble problems are presented in context of emotional stimuli. When a mammal is presented with a soluble problem, appropriate responses will be emitted; but when the problem becomes insoluble (e.g., randomization of reward options) in the presence of aversive stimuli the animal develops stereotyped, ritualistic or all or none responses as "solutions" to the problem. Even if the problem again becomes soluble, the animal maintains the stereotyped and inappropriate behaviour.

Human verbal behaviour is little different. Instead of realizing that some questions and problems may be insoluble (at present) or even nonsensical, some people either reject the problem altogether or accept it without question. This pattern is recurrent in psi research. After an initial attempt to solve the problems of psi events, some researchers reject the field totally as false without question in every respect, while others accept everything as totally true. Intermediate conditions: certain types of psi events may be true (verifiable) while others may not be true (non-verifiable) or statistical statements, are often not evoked as options.

The problem becomes exacerbated when emotional behaviours are involved. Emotional behaviours, especially anxiety-related behaviours, often occur in unstructured situations (e.g., novel situation, unexpectancy) where stimulus predictions are not possible and the likelihood of pain is quite probable. In the presence of pain anticipated situations response probabilities deteriorate or are altered. Verbal behaviour shows marked redundancy, repetition, periods of no activity, lack of discrimination and related signs of disorganization. Even private behaviours display this pattern, e.g., repeating one's thoughts to oneself, inability to discriminate similar cues, periods of "blankness".

Psi phenomena invariably deal with some negative stimulus, either because it is associated with death or injury or because it deals with some unpredictable or unexpected possibilities (a

spoon suddenly bending; old watch beginning to tick). In such situations it is not surprising that the thought responses of even the great scientists can demonstrate the expected perturbations and result in simplified, indiscriminate, all or none statements such as "all psi phenomena are true" or "all psi phenomena are false".

In the midst of an insoluble problem, other forms of escape responses can occur. At the level of verbal behaviour escape responses are often manifested in various evasive patterns that ignore or avoid the problem by substituting some technically irrelevant statement. The effects of these statements are usually positive to the reader and are readily invoked in situations which are aversive or possibly aversive (hence anxious) i.e., personal death, to the processes the person has labelled as himself or herself. Invariably, the statements evoke words heavily loaded with positive emotional associations, e.g., God, survival. Usually these statements can be recognized as "poetic", "imagery-inducing", or just semantically atypical; some border upon word salad. Examples of such statements would include: "I cannot believe that God plays dice with the universe". Although capable of evoking a series of unusual combinations of images to the human reader, the statement is technically of little value and in operation reflects the statements of a human being behaving as a poet rather than a scientist in the presence of a perceived insoluble problem.

These comments should by no means be interpreted as a complete rejection of poetic responses to insoluble problems. They may have their values in the stimulation and control of the individual's personal behaviour that would allow the motivation towards and discovery of some scientific statement capable of verification, testability, and inter-subject agreement. In other words, they may infuence the person to display scientific behaviour. However, apart from pleasant personal sensations, the technical worth and potential for prediction-control from poetic descriptions and responses to complicated issues of man's behaviour are questionable.

In the area of psi phenomena, there are repeated allusions to "ghosts in the human machine", "man as being driven by greater superconsciousness", "man as derived from spiritual sources" and similar poetic statements. Predictably, they occur in contexts of apparently insoluble features of ostensible psi-phenomena and are often correlated with the geriatric progression of the writer who constructs them. No doubt, some individuals may find worth in such solutions for their personal behaviours; however, the use of such verbal sequences for scientific solutions in psi problems remains doubtful.

PSI PHENOMENA AS A CONCEPTUAL CORE

Data [9] indicate that the majority of reports classified under the label of psi-events (or its various synonyms), directly or

indirectly involve some aspect of death or marked unexpectancy from normal/frequent environmental operations. Verbal behaviour associated with psi-phenomena seem to exist in a relatively closed net conceptual core typified implicitly by the descriptors: "unusual", bizarre", "unexpected", "death-related", "belief/unmeasurable", "non-physical", "ascientific", "altered states of consciousness", "afterlife" or "religious-like". Operationally, conceptual core indicates that the probability of talking or thinking about one type of psi-type (e.g., ghosts) is highly associated with talking about other psi-types.

Such proclivities can be noted within casual conversation, as any psi-researcher reluctantly has discovered. When a person starts talking about some psi-type, e.g., telepathy, he or she soon begins referring to accounts of astrology, acupuncture, reincarnation, psychokinesis, after-life, and a variety of similar topics. Frequently, the verbal chains associated with psi phenomena evoke personal statements of belief such as "I don't care what science says, I believe in ghosts and I just know that my husband (wife) and I can communicate". When options of explanation are given [1], the verbal and autonomic emotional behaviours, including frustrative aggressions, are increased, i.e., increased volume of voice, repeated references to "proofs" of validity.

One of the most disturbing aspects of the conceptual core relates to scientists. This experimenter has been collecting data concerning scientists' verbal responses to psi-statements. In the presence of the social (academic) peer group, psi events are rejected frequently as spurious observations, with laughter. But, in the confines of the person's home and outside the laboratory situation, even these people – who have been trained in the techniques of scientific methodology, display the properties of the conceptual core. Statements are emitted like "I don't really believe in all this nonsense, but you know when *my* father died....."

THE SCIENTIST IS STILL A VERBAL ANIMAL

When a scientist thinks about or measures the activity of a particle, cell or animal, the direction of his measure is determined in large part by the type of methodology and the social contingencies (e.g., what is sanctioned to study; promotions, etc.). With the exception of experimenter biasing, which may or may not involve "awareness", the influence of the scientist's motivation as a person – as just another human verbal animal – is for the most part minimal. Exuberance and faith in the outcome of an experiment can be easily checked with inter-experimenter replication. Since different individual experiences often lead different scientists to have individual biases in different directions, (e.g., personal or pet hypothesis), the contaminating effects of subtle belief-influences to mundane and apersonal scientific problems are attenuated by

group verification.

However do such controls still hold for scientists studying psi phenomena? This problem becomes paramount when the behavioural principles of stimulus generalization and stimulus substitution are considered. Scientists' verbal behaviour is frequently devoid of references to religious concepts within the methodology; in fact, there is strong social and peer group pressure among scientists to eliminate concepts implicative of "non-physicalness" or "spiritualness" from their vocabularies. Although occasional reference to the possibility of as yet undiscovered principles appears acceptable (if it is couched within a materialistic framework), most scientists when displaying scientist behaviour appear quite areligious. Some scientists report personal anti-religious convictions or non-belief of religious concepts.

But is it valid to assume that the scientist, as a behaving organism, can compartmentalize his "objective scientific approach" from his "personal subjective search"? Although he or she may not pursue orthodox religious patterns because it is not acceptable scientific behaviour, what would prevent such a person from substituting some similar, quasi-scientific topic and pursuing it with all the careless evangelistic fervor of any other religious emotional beh behaviour? These questions are by no means frivolous when one considers the number of well-known researchers in the area of psi-phenomena who, during interviews, e.g., see *Psychic* magazine, report strong beliefs in their personal psi experiences.

Psi-phenomena implicitly include problems about the scientist's own personal demise, the possibility of survival, non-physical realities, and perhaps most important: the sensation that there is something "more" to life. In terms of basic behavioural operations, psi-phenomena within such contexts would be a substitute for religious associations. No doubt the investigation of such phenomena would be couched within the acceptable jargon of scientific response modes; but, could the scientist discriminate his personal wishes and concomitant emotional scotomas from what he has ostensibly measured and proven?

A lonely scientist with such predilections can be challenged against some form of peer group criteria from other scientists. However, if large numbers of scientists share the same verbal repertoire and similar reinforcement histories would the degree of within group checking and evaluative rigor still be maintained? The human animal, even the scientific animal, is a peer group organism, subject to many forms of subtle (and not so subtle) peer group pressures and inertias. Are there measures for exposing scientists with a psychological proneness towards contaminating their investigations with their personal beliefs? This is not a new or unique problem for psi

research. Presently, there are academics making statements about the values of certain meditation techniques; however, the verbal behaviours demonstrate they often fail to differentiate between the report of their personal experience and the consequences of scientific evaluation.

THE SEDUCTION OF SEMANTIC SYMMETRY AND METAPHOR

Different scientific disciplines are typified by different procedures for measurement. The interpretations of the measurements, by themselves "aorganized" except by the characteristics of the measurement device, are expressed in particular verbal sequences. Although displayed in discipline-specific vehicles or metaphors, basic semantic patterns (e.g., the pattern of diametric opposition, i.e., + and - charges, electromagnetic polarity, centrifugal-centripetal forces, agonist-antagonist receptor functions, sympathetic-parasympathetic nervous system, right-wrong) are evident. Whether these patterns are veridical representations of nature or merely reflect the genetic perceptual characteristics of man the observer is at this time empirically indifferentiable. What is important is that various attempts are made to *explain* these patterns by different kinds of models or analogies, usually based upon some extension of a sensory metaphor-(e.g., "force is like the wind; you cannot see it, only feel it").

By such models, facilitated (but not necessarily accurate) verbal accommodation of complex phenomena can be realized. Unfortunately, as we have seen in the history of science, without caution there is an inertia to take the model to completion, to *reify* the model as an actual fact rather than as an ancillary tool for explanation. Often the effects of reification may not be readily apparent, but may be manifested implicitly through a form of "semantic induction" or "semantic symmetry" – an operation typically mediated by verbal implicit chains [3].

An example of this verbal operation has occurred in the history of brain research [10]. At one time, it was assumed that the brain was "like a telephone exchange". By itself, this metaphor was a helpful tool for the comprehension of a complex stimulus. Then some researchers began to reply upon the metaphor as fact and the implicit associations of the telephone exchange metaphor began to be translated into experimental questions. Verbal sequences such as "a telephone exchange has an operator controlling the lines to be used; if the brain *is*.... (not is like)..... a telephone exchange system, then it too must have an operator", began to emerge. Researchers began looking for the operator, which invariably displayed anthropomorphic features, such as a "homunculus", "a center of thought", "the true self" and related fictions. The model became the methodology.

In an interdisciplinary approach to psi research, similar

problems are imminent. Ultimately, we will use metaphors and models to aid understanding of these unexpected and atypical phenomena. Already statements have been made that psi phenomena is like another energy "form", or psychokinesis behaves like sub-atomic forces, or telepathy behaves as a wave function, or precognition looks like instances of apparent particle time reversals, or regression hypnosis seems like the person is from the past. Do we have protective devices built within our thought systems to prevent the verbal inertia towards semantically attractive but non-data based statements like "psi phenomena *is* an energy form"? Once a metaphor is reduced to an identity, i.e., "Psi is a force", then the semantic and conceptual insulation between the two are forfieted and the known or expected properties of "force" can be inappropriately generalized to psi reports. Moreover, any putative event labelled as a psi form might be interpreted in contexts of these expectations. Even statistical randomicity can be rationalized into significance.

ARE DIFFERENT DISCIPLINES MORE SUSCEPTIBLE TO THE EFFECTS OF PSI RESEARCH?

As noted, we cannot ignore the reinforcement history of the scientist when psi research is involved; certain experiences or semantic patterns may make the scientist more susceptible to personal approaches. An extension of this consideration might be phrased "are there some methodologies that make the person more prone to study psi events? Elementary vocational interests tests and similar profiles (e.g., Strong Vocational Interest Test) clearly demonstrate that people prone to engage in certain disciplines are likely to display similar behavioural interests.

As noted, psi phenomena are associated often with non-measurable processes, bordering on the infinitesimal or non-physical. Secondly, psi phenomena show marked *unpredictability* in occurrence, which is usually rationalized as implicative of extraordinarily complicated processes. In terms of verbal stimulus operations, similar patterns are contained within disciplines involving predominantly statistical phenomena, mathematical manipulations, or philosophical-religious expectations. Their commonality is contained in an air of non-empiricalness (or indirect implication) and a heavy dependence upon theoretical constructs with little possibility of direct measurement. Certain areas of theoretical physics (e.g., quantum mechanics; cosmology), humanitarian psychology, philosophy and religion are characterized by such patterns. However, theoretical/speculative branches of any science (e.g., biology during the period of vitalism) could be included. More empirical paradigms such as behavioural psychology, ecology, physiology, or physical chemistry, would be less likely involved.

Human beings with histories in such areas may find psi-related phenomena reinforcing by virtue of the apparent similarities to their respective disciplines. Certainly, a communion of this nature could allow novel solutions by individuals who are familiar with analogous problems in more well founded areas. However within these conditions the behavioural insulation between the person as a scientist and the person as a mortal human being would become thinned precariously.

FINAL COMMENT

Problems relevant to the serious researcher of psi phenomena have been discussed in this paper; there are still ramifications of these questions that must be seriously explored and answered if some of the probable pitfalls of erroneous science are to be avoided. There are still possibilities of epiphenomenal contaminations from man's verbal conditioning. The limitations of verbal behaviour – from the paucity of appropriate labels, to reliance upon the consistency of verbal response chains during aversive events, to the fact that the scientist is also a verbal animal whose personal, social and scientific behaviours are couched predominantly within the *same* response mode: verbal behaviour –, still have not been controlled sufficiently. Aspects of this paper may have appeared to be more relevant to the philosophy of science rather than to the methodology of psi research. However it should be clear that the problems of psi research lay at the base of scientific endeavour. The possibility must now be entertained that we have approached a limit of measurement and that some apparent phenomena may reflect the properties of the human measurement device. The probability must be noted that verification of psi events may involve a Heisenberg–like principle and that we are only looking at the consistent contribution from the operations and properties of human verbal behaviour.

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